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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,090	08/21/2003	Jerry Ihor Tustaniwskyi	550,692	1738
22428	7590	08/24/2006	EXAMINER	
FOLEY AND LARDNER LLP SUITE 500 3000 K STREET NW WASHINGTON, DC 20007			DATSKOVSKIY, MICHAEL V	
			ART UNIT	PAPER NUMBER
			2835	

DATE MAILED: 08/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/647,090

Applicant(s)

TUSTANIWSKYI ET AL.

Examiner

Michael V. Datskovskiy

Art Unit

2835

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 14-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
- Paper No(s)/Mail Date 26/11/06

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 14, 15, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizuno et al (EP 0 480 750 A2)..

Mizuno et al teach a system, Figs. 5, 6 for maintaining an IC-module 1 near a set-point temperature while electrical power dissipation in said IC-module is varied; said system being comprised of: a container 5 having an open end with a seal for pressing against said IC-module 1; at least one nozzle 8, in said container 5, for spraying a liquid coolant on said IC-module when said seal is pressed against an exposed surface on said IC-module; a pressure reducing means 32, coupled to said container, for producing a sub-atmospheric pressure between said container and said IC-module when said seal is pressed against said IC-module (col. 4, lines 7-27); wherein said pressure reducing means including a pressure regulating means (Figs. 8-13, and description in col.4, line 49 through col. 6, line 16). Mizuno et al do not teach maintaining said sub-atmospheric pressure such that the boiling point of said liquid coolant is lower by at least 10°C from its boiling point at atmospheric pressure, while the temperature of said IC- module is kept near said set-point (claim 14); or said pressure reducing means reduces said sub-atmospheric pressure to a point where essentially all of said liquid coolant from each

Art Unit: 2835

nozzle rapidly vaporizes when it hits said Ic-module. (Mizuno et al teach maintaining said sub-atmospheric pressure at an optimum sub-atmospheric level in respect to a condition favoring the tendency of coolant to boil (col. 4, lines 15-18), without specifying the boiling temperature. It would have been obvious to one having ordinary skill in the art at the time invention was made to maintaining said sub-atmospheric pressure such that the boiling point of said liquid coolant is lower by at least 10°C from its boiling point at atmospheric pressure, while the temperature of said IC- module is kept near said set-point, or to reduce said sub-atmospheric pressure to a point where essentially all of said liquid coolant from each nozzle rapidly vaporizes when it hits said Ic-module, in the device by Mizuno et al, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mizuno et al.

Mizuno et al teach all the limitations of the claim except said IC-module is enclosed by a cover enclosing an IC-chip and said seal is pressed against said cover of said IC-module. It would have been obvious to one ordinary skilled in the art at the time

invention was made to use a system for maintaining an IC-module at a sub-atmospheric temperature described by Mizuno et al for testing an IC-module either having a cover or without a cover, having an exposed IC-chip, since applicant has not disclosed that a type of the IC-module (covered or not) solves any stated problem or is for any particular purpose and it appears that the invention by Mizuno et al (as well as the proposed invention) would perform equally well with any kind of an IC-module being tested.

5. Claims 17-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over embodiment shown by Mizuno et al in view of Patel et al (US Patent 6,550,263).

Mizuno et al teach all the limitations of the claims except said system includes an incremental droplets control system (described in the specification of the instant application as used for ink-jets control in printers), wherein said control system including a close d-loop control means for receiving a sensor signal about a temperature of said IC-module and sending a control signal based on said IC-module temperature to all or a specific quantity of said spray nozzles (claims 5-6) allowing said spray nozzles to eject a single droplet (claim 5), or multiple nozzles to eject simultaneously with a frequency increasing corresponding to increase of said temperature (claims 7, 11). Mizuno et al also do not teach each nozzle ejecting droplets by squeezing a coolant with a piezoelectric device (claim 8) or by heating said coolant with an electric heater (claim 9). Patel et al teach a spray cooling system for IC-modules comprising: an incremental droplets control system (described in the specification as used for ink-jets control in printers. (See Abstract), said control system including a close d-loop control means for

Art Unit: 2835

receiving a sensor signal about a temperature of said IC-module and sending a control signal (col. 5, lines 37-44) based on said IC-module temperature (col. 6, lines 54-61) to all or a specific quantity from just one (col. 6, lines 34-35) to all of said spray nozzles (Coil. 6, lines 35-38) allowing said spray nozzles to eject a single droplet or multiple nozzles to eject simultaneously with a frequency increasing corresponding to increase of said temperature and vaporize all of the cooling fluid (col. 5, lines 30-35). Patel et al also teach each nozzle ejecting droplets by squeezing a coolant with a piezoelectric device or by heating said coolant with an electric heater (col. 6, lines 42-54). It would have been obvious to one ordinary skilled in the art at the time invention was made to use a system for maintaining an IC-module temperature described by Patel et al in the device by Mizuno et al in order to make said cooling system more accurate, reliable and cost-efficient.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael V. Datskovskiy whose telephone number is (571) 272-2040. The examiner can normally be reached on 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn Feild can be reached on (571) 272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2835

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

 Michael V Datskovskiy  
Primary Examiner  
Art Unit 2835

07/19/2006